

# PATENT ABSTRACTS OF JAPAN

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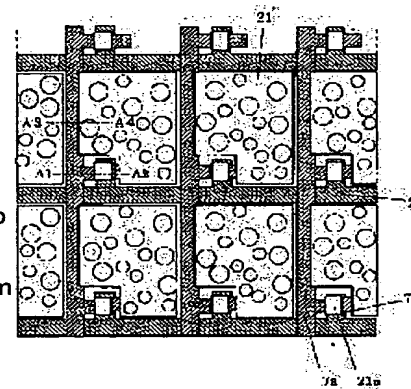
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## (54) REFLECTION TYPE LIQUID CRYSTAL DISPLAY DEVICE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a bright reflection type liquid crystal display device having high reflection in which a short-circuited part can be specified from a TFT array substrate rear face at generation of a short-circuit between pixels, and to provide the reflection type liquid crystal display device, in which a channel part can be shielded and processing for forming black dots is possible.

**SOLUTION:** The device has a plurality of thin-film transistors, a gate wiring group 2, a source wiring group 7a, and a plurality of reflective pixel electrodes 21 connected respectively at a drain electrode 7b of each of the plurality of thin-film transistors on one principal surface of one of two substrates 1a holding a liquid crystal layer. The reflective pixel electrode is disposed so that it may have the overlap with one source line and may have the clearance with the other source line to two adjacent source lines. Besides, the channel part and its neighborhood are light-shielded by a metal film 21a of the same material as the reflective pixel electrode, and the metal film is made to open in the crossover parts of the gate wiring and the drain.



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**CLAIMS**

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[Claim(s)]

[Claim 1] On one 1 principal plane of two substrates which pinch a liquid crystal layer, two or more thin film transistors, In the reflective mold liquid crystal display which has a gate wiring group, a source wiring group, and two or more reflective pixel electrodes respectively connected to the drain electrode of two or more of said thin film transistors The reflective mold liquid crystal display which has a lap with one source line and is characterized by having arranged so that it may have a gap with the source line of another side to two source lines which adjoin said reflective pixel electrode.

[Claim 2] On one 1 principal plane of two substrates which pinch a liquid crystal layer, two or more thin film transistors, In the reflective mold liquid crystal display which has a gate wiring group, a source wiring group, and two or more reflective pixel electrodes respectively connected to the drain electrode of two or more of said thin film transistors The reflective mold liquid crystal display characterized by for the channel section of said thin film transistor and its near being shaded by the metal membrane of a reflective pixel electrode and this ingredient, and carrying out opening of said metal membrane in a part for the intersection crotched portion of said gate wiring and said drain electrode.

[Claim 3] The reflective mold liquid crystal display according to claim 2 characterized by setting width of face of metal membrane opening for an intersection crotched portion of gate wiring near the channel section, and a drain electrode to 1 micrometers or more.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the reflective mold liquid crystal display which drives liquid crystal using the TFT array substrate with which two or more thin film transistors were formed, and its manufacture approach.

[0002]

[Description of the Prior Art] The liquid crystal which intervenes between color filter substrates from the former using the TFT array substrate with which two or more thin film transistors (it is hereafter called TFT for short) were formed on the 1 principal plane as an image display device is driven, and the liquid crystal display of the transparency mold which displays an image with the liquid crystal is used widely. Moreover, it is the outdoors and the mold for an environment which can be used indoors, and the thin shape and the lightweight reflective mold liquid crystal display have been proposed and developed by the high definition which performs a display action with a low power.

[0003] Hereafter, a reflective mold liquid crystal display is explained with reference to drawing 3 – drawing 5 as an example. The top view in which drawing 3 (a) shows the pixel configuration of the conventional reflective mold liquid crystal display, drawing 3 (b), and drawing 4 are the sectional views of the important section. Drawing 5 is the enlarged drawing of a channel and its near.

[0004] The production process of the TFT array substrate T1 of this reflective mold liquid crystal display is explained. First, the gate electrode / gate wiring 2 which consists of a tantalum, chromium, etc. are formed on one transparency glass substrate 1a. Next, the gate dielectric film 3 and 4 which usually consists of a bilayer is made to deposit using sputtering and vapor growth. Next, the semi-conductor film (amorphous silicon film) 5 as which the resistance changes and TFT is operated as a switch with the electrical potential difference impressed is formed. Next, the n<sup>+</sup>a-Si layer 6 for carrying out ohmic contact of the source mentioned later, and a drain electrode and the semi-conductor film 5 is formed. And the source electrode / source wiring 7a, and drain electrode 7b which consist of titanium, a tantalum, and metals, such as molybdenum, are formed in coincidence. Next, a photopolymer 9 is applied after making SiNx used as a protective coat 8 deposit. It heat-treats, after exposing and developing a photopolymer 9 using the mask with which the circle-like opening pattern was arranged irregularly continuously, and two or more irregularity is formed. And a photopolymer 10 is applied so that two or more irregularity may be met, and irregularity is smoothed so that a desired diffuse reflection property may be acquired. The reflective pixel electrode 11 which consists of a metal membrane on it is formed. At this time, it considers as the configuration which shades the channel section and its near by metal membrane 11a of the reflective pixel electrode 11 and this ingredient, and shades the channel section by the wrap. The TFT array substrate T1 is completed by the above production process.

[0005] Next, manufacture of the color filter substrate F1 is explained. First, after forming the black matrix 12 set to one more transparency glass substrate 1b from chromium etc., red and the color filter 13 of green or blue are formed. Furthermore, the color filter substrate F1 is completed by forming the opposite pixel electrode 14 on it.

[0006] Then, the process which manufactures a reflective mold liquid crystal display is explained from the TFT array substrate T1 and the color filter substrate F1. First, the fully washed above-mentioned TFT array substrate T1 is made to apply and calcinate the polyimide orientation film (not shown) by print processes. And rubbing is carried out and an one direction is made to carry out orientation of the polyimide molecule with the cloth which coiled around the roller. Next, the orientation film (not shown) is formed also like the color filter substrate F1, and rubbing is performed.

[0007] A sealing compound (not shown) is applied to the TFT array substrate T1 after orientation processing, and the spacer (not shown) which has a fixed diameter is sprinkled. In case this sticks the TFT array substrate T1 and the color filter substrate F1, it is for maintaining a fixed gap. After carrying out precure of the sealing compound and sprinkling a spacer, lamination and a sealing compound are completely stiffened for the TFT array substrate T1 and the color filter substrate F1. And liquid crystal 15 is poured in between substrates by the vacua, encapsulant stops between substrates, and a reflective mold liquid crystal display is completed by arranging a polarizing plate (not shown) before and after the transparency glass substrates 1a and 1b.

[0008] In addition, in the manufacture process of the TFT array substrate T1, it may short-circuit between the pixels which adjoin with the dust in front of a photolithography or dry etching, and between the source and a drain. It stops taking [ normal potential ] for a pixel at this time, and becomes a point

defect. Moreover, that location becomes clear by the inspection process after this point defect completed the liquid crystal display. As a former cure, the short part between pixels is omitted with laser from the TFT array substrate side of a liquid crystal display. The method of making potential of the pixel section into the condition that an electrical potential difference is always built over a pixel as the gate and this potential, and sunspot-izing it is taken by carrying out laser radiation of the gate of a transistor and the intersection crotched portion of a drain which short-circuit generated on the same conditions as a latter cure from the rear face of a liquid crystal display.

[0009] In subsequent explanation, it calls it sunspot-ized processing to make potential of the pixel section into the gate and this potential, and to sunspot-ize it by carrying out laser radiation of the gate of a transistor, and the intersection crotched portion of a drain.

[0010]

[Problem(s) to be Solved by the Invention] In order to raise the brightness of a display of a reflective mold liquid crystal display, the reflective pixel electrode 11 is so desirable that the surface area is large. On gate dielectric film 4, as shown in drawing 4 , since it is formed at the very thick photopolymer film 9 top, respectively and short-circuit does not occur between source wiring 7a and a pixel, between source wiring 7a and the reflective pixel electrode 11, source wiring 7a does not need to give spacing in the direction of a field, and can pile up the reflective pixel electrode 11.

[0011] However, when short-circuit occurs in the reflective pixel inter-electrode which adjoins in this case, the technical problem that a short part cannot be pinpointed arises seen from the rear face of the TFT array substrate T1.

[0012] Moreover, since the intersection crotched portion of the gate electrode 2 of a transistor and drain electrode 7b will also be covered by metal membrane 11a if the channel section and its near are shaded by metal membrane 11a of a reflective pixel electrode and this ingredient as shown in drawing 5 , When laser radiation is carried out to the intersection crotched portion of the gate electrode 2 and drain electrode 7b, the ITO pattern by the side of drain electrode 7b on it, metal membrane 11a, and also the color filter substrate F1 on it will short-circuit. Consequently, the pixel concerned serves as ITO by the side of the color filter substrate F1, and this potential, an electrical potential difference stops building over liquid crystal, and the luminescent spot will come. Therefore, the fault that it cannot sunspot--ization-process arises.

[0013]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention improves the reflective mold liquid crystal display which has two or more thin film transistors, a gate wiring group, a source wiring group, and two or more reflective pixel electrodes respectively connected to the drain electrode of two or more thin film transistors on one 1 principal plane of two substrates which pinch a liquid crystal layer. Namely, to two source lines which adjoin a reflective pixel electrode, with one source line, the reflective mold liquid crystal display of this invention has a lap, and is arranging [ so that it may have a gap ] characterized [ line / of another side / source ] by it.

[0014] According to this configuration, when the short-circuit between pixels occurs, while being able to pinpoint a short part and being able to carry out the lasing from the rear-face side of a TFT array substrate, by making one side of a source line intersect a pixel, surface area of a reflective pixel electrode can be enlarged and the bright reflective mold liquid crystal display of high reflection can be realized.

[0015] Moreover, it has the same basic configuration as the above, the channel section of a thin film transistor and its near are shaded by the metal membrane of a reflective pixel electrode and this ingredient, and the reflective mold liquid crystal display of this invention is the configuration to which opening of the metal membrane was carried out in a part for the intersection crotched portion of gate wiring and a drain electrode. Sunspot-ized processing is attained by carrying out opening of the gate and the intersection crotched portion of a drain.

[0016] In the above-mentioned configuration, it is desirable to set width of face of metal membrane

opening for an intersection crotched portion of gate wiring near the channel section and a drain electrode to 1 micrometers or more. Even if it makes the gate and a drain short-circuit by laser radiation by carrying out 1-micrometer or more opening, sunspot-ized processing can be performed normally, without [ a drain, a protection-from-light pattern, and ] making a protection-from-light pattern and an ITO pattern short-circuit further.

[0017]

[Embodiment of the Invention] Drawing 1 and drawing 2 show the pixel configuration of the reflective mold liquid crystal display which is the gestalt of operation of this invention. The top view, drawing 2 (a), and (b of drawing 1 R> 1) are the expanded sectional views of an important section. Drawing 2 (c) is the enlarged drawing of a channel and its near. The same reference mark was attached about the same component as the conventional example shown in drawing 5 from drawing 3 . The configuration shown in drawing 1 and drawing 2 is explained according to a production process.

[0018] The gate electrode / gate wiring 2 which consists of a tantalum, chromium, etc. are first formed on glass substrate 1a of transparence like the conventional example. Next, sequential formation of the gate dielectric film 3 and 4 which consists of a bilayer, the semi-conductor film 5, and the ohmic layer (n+a-Si) 6 is carried out. A source electrode / source wiring 7a, and drain electrode 7b are formed on it. Next, a photopolymer 9 is applied after making SiNx used as a protective coat 8 deposit. It heat-treats, after exposing and developing a photopolymer 9 using the mask with which the circle-like opening pattern was arranged irregularly continuously, and two or more irregularity (not shown) is formed. And a photopolymer 10 is applied so that two or more irregularity may be met, and the reflective pixel electrode 21 which consists of a metal membrane on it is formed.

[0019] Here, in case the reflective pixel electrode 21 is formed, to adjoining two source wiring 7a, with one source wiring 7a, a lap is given, and as spacing is given with source wiring 7a of another side, it arranges. Moreover, by metal membrane 21a which consists of the same ingredient, patterning is carried out so that the channel section and its near may be covered, at the same time it forms the reflective pixel electrode 21. At this time, the intersection crotched portion top of the gate electrode 2 and drain electrode 7b carries out opening of the metal membrane 21a. The enlarged drawing of the opening part is shown in drawing 2 (c). As for the width of face L of the opening part in drawing 2 (c), it is desirable to be referred to as  $L \geq 1$  micrometer.

[0020] When short-circuit occurs between the adjoining reflective pixel electrodes 21, enlarging surface area of the reflective pixel electrode 21 by considering as the above configuration, from the rear-face side of the TFT array substrate T1, a short part can be pinpointed and the laser cut of the short part can be carried out. Moreover, the sunspot-ized processing from the rear face of a TFT array substrate is attained by carrying out opening of the metal membrane 21a in the gate near the channel section, and the intersection crotched portion of a drain.

[0021]

[Effect of the Invention] Since a short part can be pinpointed when short-circuit occurs in adjoining reflective pixel inter-electrode according to this invention, simplification of a rescue and increase in efficiency can be calculated. Moreover, since sunspot-ized processing can be performed from the part to which opening of the gate near the channel section and the metal membrane on the intersection crotched portion of a drain was carried out even when normal potential is not built over a pixel according to short generating between the source and a drain etc., it leads to improvement in the yield.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1] The top view showing the pixel configuration of the reflective mold liquid crystal display in the gestalt of operation of this invention

[Drawing 2] It is drawing expanding and showing the important section of drawing 1 , and, for (a) and (b), a sectional view and (c) are a channel and the partial expansion top view of the near.

[Drawing 3] An example of the pixel configuration in the conventional reflective mold liquid crystal display is shown, for (a), it is the top view and (b) is the expanded sectional view of an important section.

[Drawing 4] The expanded sectional view of the important section in the reflective mold liquid crystal display of drawing 3

[Drawing 5] The partial expansion top view showing the channel in the reflective mold liquid crystal display of drawing 3, and its near

[Description of Notations]

1a, 1b Transparence glass substrate

2 Gate Wiring / Gate Electrode

3 1st Gate Dielectric Film

4 2nd Gate Dielectric Film

5 Semi-conductor Film

6 N+a-Si Film

7a Source wiring / source electrode

7b Drain electrode

8 Protective Coat

9 Photopolymer Film

10 Photopolymer Film

11 Reflective Pixel Electrode

11a Metal membrane

12 Black Matrix

13 Color Filter

14 Opposite Pixel Electrode

15 Liquid Crystal

21 Reflective Pixel Electrode

21a Metal membrane

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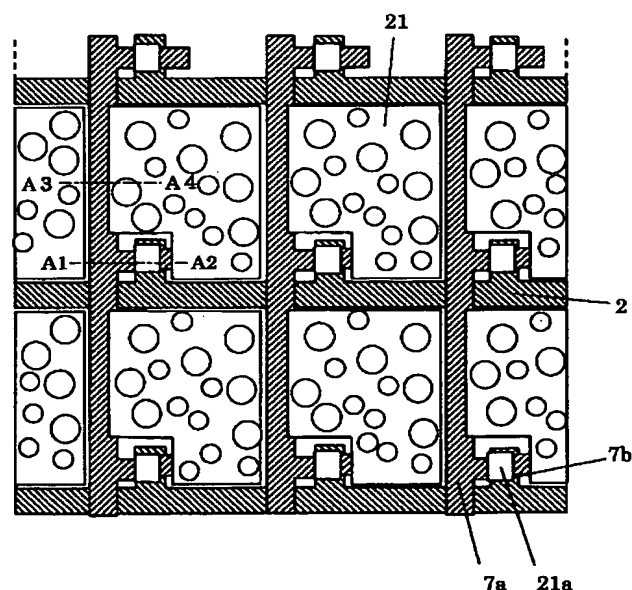
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(54)【発明の名称】 反射型液晶表示装置

(57)【要約】

【課題】 画素間のショート発生時にショート箇所をTFTアレイ基板裏面から特定でき、かつ高反射の明るい反射型液晶表示装置を提供する。また、チャンネル部を遮光でき、かつ黒点化処理が可能である反射型液晶表示装置を提供する。

【解決手段】 液晶層を挟持する2枚の基板1aの一方の一主面上に、複数の薄膜トランジスタと、ゲート配線群2と、ソース配線群7aと、複数の薄膜トランジスタのドレイン電極7bに各々接続された複数の反射画素電極21とを有する。反射画素電極は、隣接する2本のソース線に対して、一方のソース線とは重なりをもち、他方のソース線とは間隙を有するように配置する。また、チャンネル部およびその近傍を反射画素電極と同材料の金属膜21aによって遮光し、かつゲート配線とドレインの交叉部分ではその金属膜を開口させる。



(2)

## 【特許請求の範囲】

【請求項1】 液晶層を挟持する2枚の基板の一方の主面上に、複数の薄膜トランジスタと、ゲート配線群と、ソース配線群と、前記複数の薄膜トランジスタのドレイン電極に各々接続された複数の反射画素電極とを有する反射型液晶表示装置において、前記反射画素電極を、隣接する2本のソース線に対して、一方のソース線とは重なりをもち、他方のソース線とは間隙を有するように配置したことを特徴とする反射型液晶表示装置。

【請求項2】 液晶層を挟持する2枚の基板の一方の主面上に、複数の薄膜トランジスタと、ゲート配線群と、ソース配線群と、前記複数の薄膜トランジスタのドレイン電極に各々接続された複数の反射画素電極とを有する反射型液晶表示装置において、前記薄膜トランジスタのチャンネル部およびその近傍が反射画素電極と同材料の金属膜によって遮光され、前記ゲート配線と前記ドレイン電極の交叉部分では前記金属膜を開口させたことを特徴とする反射型液晶表示装置。

【請求項3】 チャンネル部近傍のゲート配線とドレイン電極の交叉部分の金属膜開口の幅を $1\mu\text{m}$ 以上としたことを特徴とする請求項2に記載の反射型液晶表示装置。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、複数の薄膜トランジスタが形成されたTFTアレイベースを用いて液晶を駆動する反射型液晶表示装置とその製造方法に関する。

## 【0002】

【従来の技術】従来から、画像表示装置として、一主面上に複数の薄膜トランジスタ（以下、TFTと略称する）が形成されたTFTアレイベースを用いて、カラーフィルタ基板との間に介在する液晶を駆動し、その液晶により画像を表示する透過型の液晶表示装置が広く利用されている。また、屋外や、屋内で使用できる対環境型であり、かつ低消費電力で表示動作を行う高画質で薄型・軽量の反射型液晶表示装置が提案され、開発されてきている。

【0003】以下、一例として、反射型液晶表示装置について、図3～図5を参照して説明する。図3(a)は、従来の反射型液晶表示装置の画素構成を示す平面図、図3(b)及び図4は、その要部の断面図である。図5はチャンネルおよびその近傍の拡大図である。

【0004】この反射型液晶表示装置のTFTアレイベースT1の製造工程について説明する。まず、1枚の透明ガラス基板1a上に、タンタルやクロム等からなるゲート電極/ゲート配線2を形成する。次に、通常二層からなるゲート絶縁膜3と4をスパッタリングおよび、気相成長法を用いて堆積させる。次に、印加される電圧によってその抵抗値が変化しTFTをスイッチとして機能させる半導体膜（アモルファスシリコン膜）5を形成する。次に、後述するソース、および、ドレイン電極と半

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導体膜5をオーミックコンタクトさせるための、 $n+a-Si$ 層6を形成する。そして、チタンや、タンタルや、モリブデン等の金属からなるソース電極/ソース配線7aとドレイン電極7bを同時に形成する。次に保護膜8となる $SiNx$ を堆積させた後、感光性樹脂9を塗布する。続けて感光性樹脂9を円状開口パターンが不規則に配列されたマスクを用いて露光および現像した後に熱処理をおこない、複数の凹凸を形成する。そして、複数の凹凸に沿うように感光性樹脂10を塗布し、所望の拡散反射特性が得られるように凹凸を滑らかにする。その上に金属膜から成る反射画素電極11を形成する。このとき反射画素電極11と同材料の金属膜11aによってチャンネル部およびその近傍を覆うとにより、チャンネル部を遮光する構成とする。以上の製造工程により、TFTアレイベースT1が完成する。

【0005】次に、カラーフィルタ基板F1の製造について説明する。まず、もう一枚の透明ガラス基板1bに、クロム等からなるブラックマトリクス12を形成した後、赤、緑または青のカラーフィルタ13を形成する。さらに、その上に対向画素電極14を形成することによって、カラーフィルタ基板F1が完成する。

【0006】続いて、TFTアレイベースT1およびカラーフィルタ基板F1から、反射型液晶表示装置を製造する工程について説明する。まず、十分に洗浄した前述のTFTアレイベースT1にポリイミド配向膜（図示せず）を印刷法によって塗布し、焼成させる。そして、ローラーに巻き付いた布によってラビングし、一方向にポリイミド分子を配向させる。次にカラーフィルタ基板F1にも同様に配向膜（図示せず）を形成し、ラビングを行う。

【0007】配向処理の後、TFTアレイベースT1にシール剤（図示せず）を塗布し、一定の直径を有するスペーサー（図示せず）を散布する。これはTFTアレイベースT1とカラーフィルタ基板F1を貼り合わせる際に一定のギャップを保たせるためである。シール剤を予備硬化し、スペーサーを散布した後、TFTアレイベースT1とカラーフィルタ基板F1を貼り合わせ、シール剤を完全に硬化させる。そして、真空状態で基板間に液晶15を注入し、封止剤で基板間を封じ、透明ガラス基板1a、1bの前後に偏光板（図示せず）を配置することによって反射型液晶表示装置が完成する。

【0008】なお、TFTアレイベースT1の製造過程において、フォトリソグラフィやドライエッチング前のゴミによって隣接する画素間やソースとドレイン間でショートする場合がある。このとき画素に正常の電位がかからなくなり、点欠陥となる。また、この点欠陥は、液晶表示装置を完成させた後の検査工程でその位置が明らかになる。前者の対策としては、画素間のショート箇所を液晶表示装置のTFTアレイベース側からレーザーによってカットする。後者の対策としては、同様な条件でショ



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液晶表示装置を実現できる。

【0015】また、本発明の反射型液晶表示装置は、上記と同様の基本構成を有し、薄膜トランジスタのチャネル部およびその近傍が反射画素電極と同材料の金属膜によって遮光され、ゲート配線とドレイン電極の交叉部分では金属膜を開口させた構成である。ゲートとドレインの交叉部を開口させておくことにより、黒点化処理が可能となる。

【0016】上記構成において、チャネル部近傍のゲート配線とドレイン電極の交叉部分の金属膜開口の幅を、 $1\mu\text{m}$ 以上とすることが望ましい。 $1\mu\text{m}$ 以上開口させることによって、ゲートとドレインをレーザー照射によってショートさせても、ドレインと遮光パターン、さらには遮光パターンとITOパターンとをショートさせずに、正常に黒点化処理ができる。

【0017】

【発明の実施の形態】図１および図２は、本発明の実施の形態である反射型液晶表示装置の画素構成を示す。図１はその平面図、図２（ａ）および（ｂ）は要部の拡大断面図である。図２（ｃ）は、チャネルおよびその近傍の拡大図である。図３から図５に示した従来例と同様の構成要素については、同一の参照符号を付した。図１および図２に示された構成について、製造工程に従って説明する。

【0018】従来例と同様に、まず透明のガラス基板1a上に、タンタルやクロム等からなるゲート電極／ゲート配線2を形成する。次に、二層からなるゲート絶縁膜3及び4、半導体膜5、オーミック層(n+a-Si)6を順次形成する。その上にソース電極／ソース配線7aと、ドレイン電極7bを形成する。次に保護膜8となるSiNxを堆積させた後、感光性樹脂9を塗布する。続けて感光性樹脂9を円状開口パターンが不規則に配列されたマスクを用いて露光および現像した後に熱処理をおこない、複数の凹凸(図示せず)を形成する。そして、複数の凹凸に沿うように感光性樹脂10を塗布し、その上に金属膜から成る反射素電極21を形成する。

【0019】ここで、反射画素電極21を形成する際に、隣接する2本のソース配線7aに対して、一方のソース配線7aとは重なりをもたせ、他方のソース配線7aとは間隔をもたせるようにして配置する。また反射画素電極21を形成すると同時に、同じ材料からなる金属膜21aで、チャンネル部およびその近傍を覆うようにパタニングする。このとき、ゲート電極2とドレイン電極7bの交叉部上は、金属膜21aを開口させておく。その開口部分の拡大図が図2(c)に示される。図2

(c)における開口部分の幅 $L$ は、 $L \geq 1 \mu m$ とすることが望ましい。

【００２０】以上の構成とすることにより、反射画素電極２１の表面積を大きくしつつ、隣接する反射画素電極２１間でショートが発生した場合に、ＴＦＴアレイ基板

(4)

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T1の裏面側から、ショート箇所を特定することができ、ショート箇所をレーザーカットすることができる。また、チャンネル部近傍のゲートとドレインの交叉部で金属膜21aを開口させることによってTFTアレイ基板の裏面からの黒点化処理が可能となる。

## 【0021】

【発明の効果】本発明によると、隣接する反射画素電極間でショートが発生した場合に、ショート箇所を特定することができるため、レスキューの簡略化、効率化をはかることができる。また、ソースとドレイン間でのショート発生などによって画素に正常な電位がかからない場合でもチャンネル部近傍のゲートとドレインの交叉部上の金属膜を開口させた部分から黒点化処理をおこなうことができるため、歩留まりの向上につながる。

## 【図面の簡単な説明】

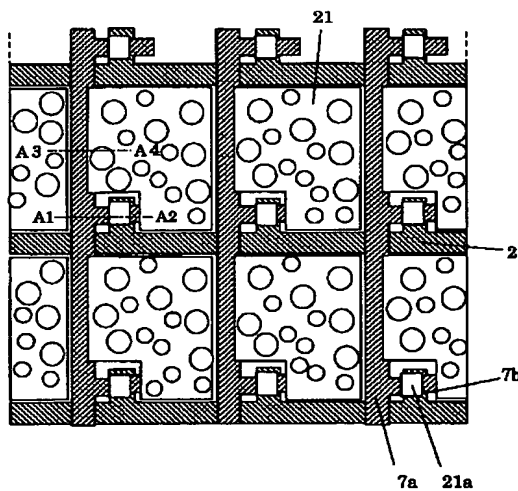
【図1】本発明の実施の形態における反射型液晶表示装置の画素構成を示す平面図

【図2】図1の要部を拡大して示す図であり、(a)および(b)は断面図、(c)はチャンネルおよびその近傍の部分拡大平面図

【図3】従来の反射型液晶表示装置における画素構成の一例を示し、(a)はその平面図、(b)は要部の拡大断面図

【図4】図3の反射型液晶表示装置における要部の拡大

【図1】



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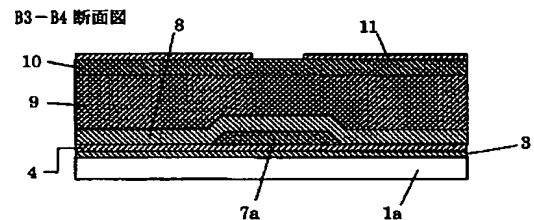
## 断面図

【図5】図3の反射型液晶表示装置におけるチャンネルおよびその近傍を示す部分拡大平面図

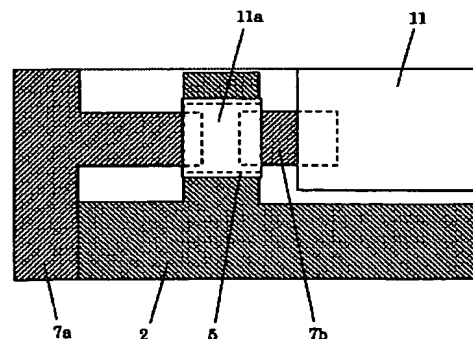
## 【符号の説明】

- 1 a、1 b 透明ガラス基板
- 2 ゲート配線/ゲート電極
- 3 第1のゲート絶縁膜
- 4 第2のゲート絶縁膜
- 5 半導体膜
- 10 n+a-Si膜
- 7 a ソース配線/ソース電極
- 7 b ドレイン電極
- 8 保護膜
- 9 感光性樹脂膜
- 10 感光性樹脂膜
- 11 反射画素電極
- 11 a 金属膜
- 12 ブラックマトリクス
- 13 カラーフィルタ
- 20 14 対向画素電極
- 15 液晶
- 21 反射画素電極
- 21 a 金属膜

【図4】



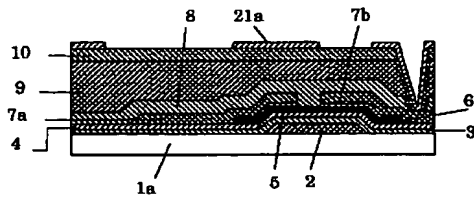
【図5】



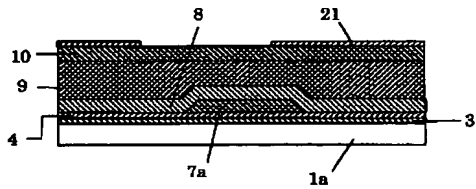
(5)

【図 2】

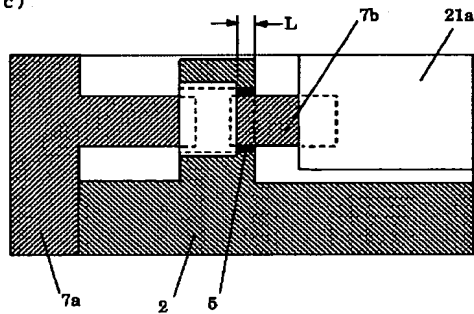
(a) A1-A2 断面図



(b) A3-A4 断面図

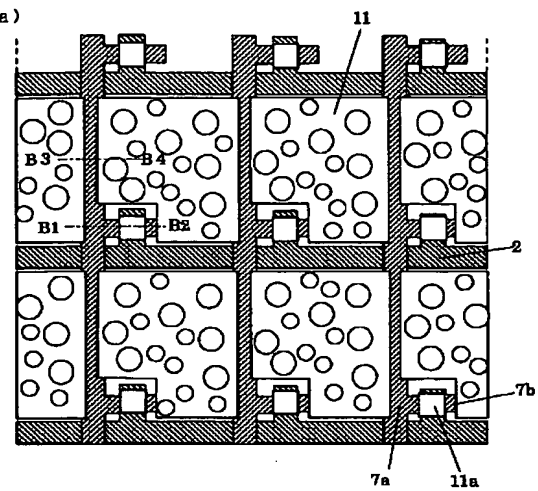


(c)

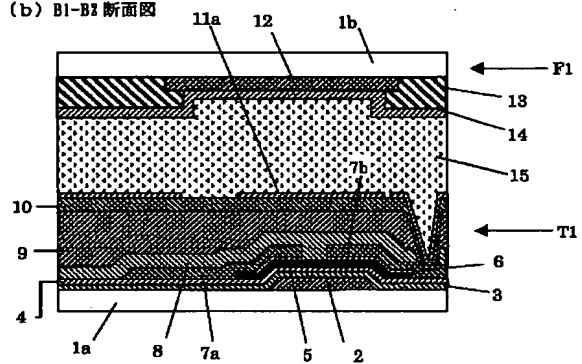


【図 3】

(a)



(b) B1-B2 断面図



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